

CNZ1413A (ON1413A)

Integrated Photosensors

Overview

CNZ1413A are ultraminiature, highly reliable transmissive photosensors consisting of a high-efficiency GaAs infrared light emitting diode chip that is integrated with a high-sensitivity Si-integrated-photodetector chip in a double molded resin package.

Features

- Ultraminiature: 4.2 mm × 4.2 mm (height: 5.2 mm)
- Fast response: $t_{PHL} = 2.5 \mu s$, $t_{PLH} = 6 \mu s$ (typ.)
- Highly precise position detection (slit width: 0.3 mm)
- Gap width: 1.2 mm
- With attachment positioning pin

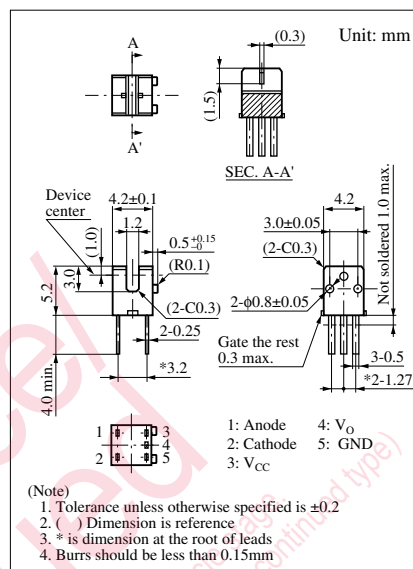
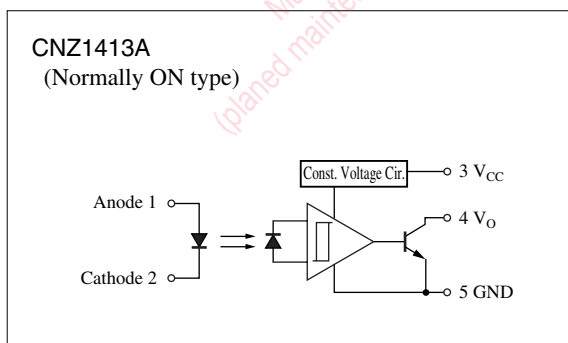
Absolute Maximum Ratings $T_a = 25^\circ C$

	Parameter	Symbol	Rating	Unit
Input (Light emitting diode)	Reverse voltage (DC)	V_R	6	V
	Forward current (DC)	I_F	50	mA
	Power dissipation *1	P_D	75	mW
Output (Photo IC)	Output current	I_O	20	mA
	Output voltage	V_O	30	V
	Supply voltage	V_{CC}	17	V
	Power dissipation *2	P_C	200	mW
Temperature	Operating ambient temperature	T_{opr}	-25 to +85	$^\circ C$
	Storage temperature	T_{stg}	-40 to +100	$^\circ C$

Note) *1: Input power derating ratio is 1.0 mW/ $^\circ C$ at $T_a = 25^\circ C$

*2: Output power derating ratio is 2.67 mW/ $^\circ C$ at $T_a = 25^\circ C$

Pin Connection



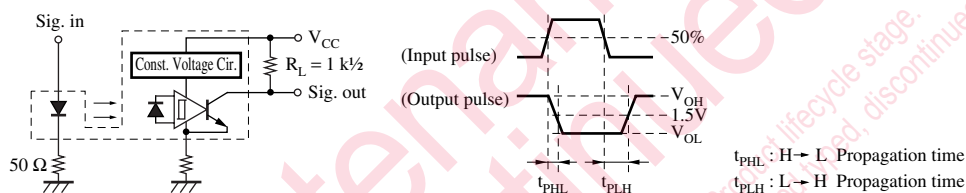
Note) The part number in the parenthesis shows conventional part number.

■ Electro-optical Characteristics $T_a = 25^\circ\text{C}$

	Parameter	Symbol	Conditions	Min	Typ	Max	Unit
Input characteristics	Forward voltage (DC)	V_F	$I_F = 20\text{ mA}$		1.2	1.4	V
	Reverse current (DC)	I_R	$V_R = 3\text{ V}$			10	μA
Output characteristics	High output current	I_{OH}	$V_{CC} = 5\text{ V}$, $V_{OH} = 30\text{ V}$, $I_F = 0\text{ mA}$			100	μA
	Low output voltage	V_{OL}	$V_{CC} = 5\text{ V}$, $I_{OL} = 20\text{ mA}$, $I_F = 5\text{ mA}$		0.15	0.4	V
	Operating power voltage	V_{CC}			4.5	17	V
	Low-level supply current	I_{CCL}	$V_{CC} = 5\text{ V}$, $I_F = 5\text{ mA}$		2.4	5	mA
	High-level supply current	I_{CCH}	$V_{CC} = 5\text{ V}$, $I_F = 0\text{ mA}$		0.8	3	mA
Transfer characteristics	Threshold input current	$I_{FH \rightarrow L} (I_{FL \rightarrow H})$	$V_{CC} = 5\text{ V}$			5	mA
	Hysteresis	$I_{FLH}/I_{FHL} (I_{FHL}/I_{FLH})$	$V_{CC} = 5\text{ V}$		0.7		
	Response time	$t_{PHL} (t_{PLH})^*$	$V_{CC} = 5\text{ V}$, $I_F = 5\text{ mA}$, $I_L = 1\text{ K}^{1/2}$		2.5(3.5)		μs
		$t_{PLH} (t_{PHL})^*$	$V_{CC} = 5\text{ V}$, $I_F = 5\text{ mA}$, $I_L = 1\text{ K}^{1/2}$		6(5)		μs

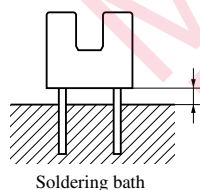
Note) 1. Normally On type characteristics is shown, () shows Normally Off type

2. *: Switching time measurement circuit



• Important Information for Soldering

1. Soldering Position



A: Make sure the distance is 0.1 mm or more.

2. Solder Temperature and Soldering Time

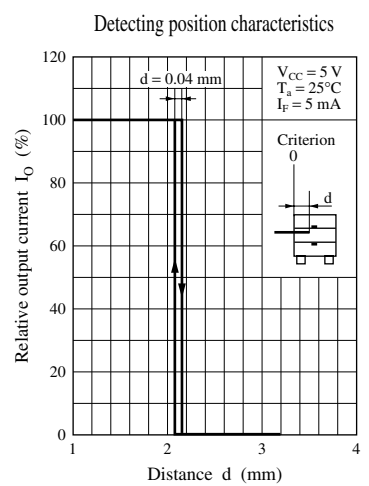
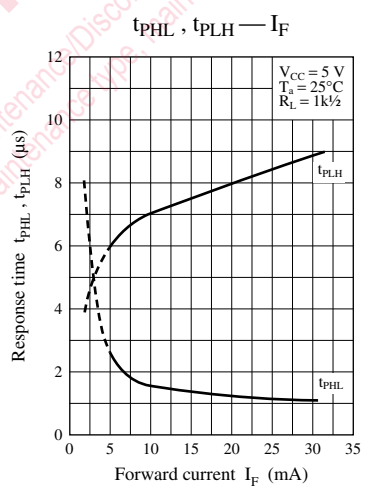
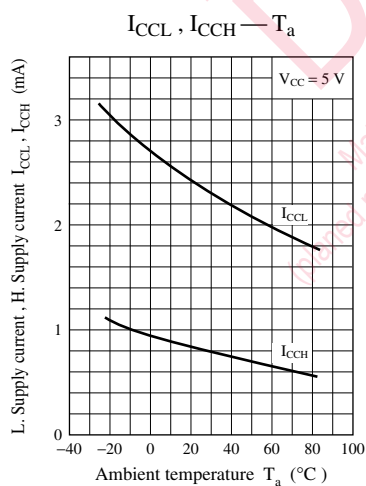
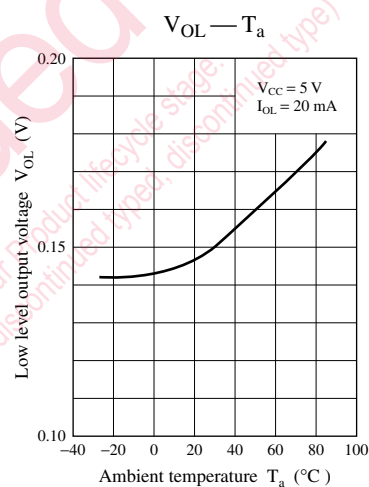
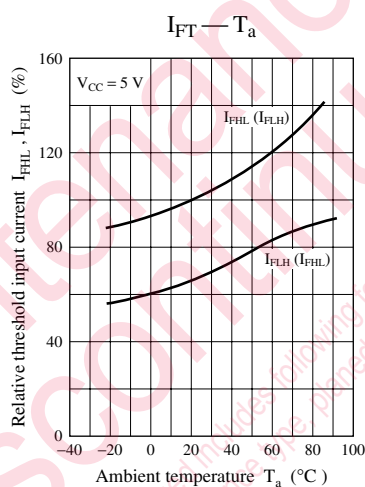
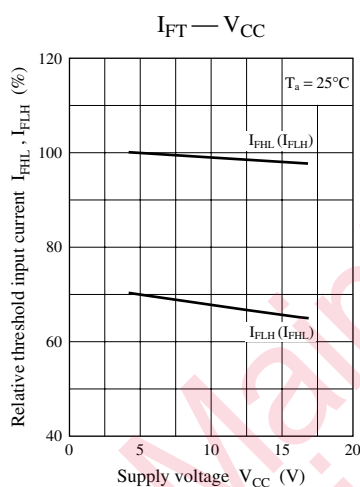
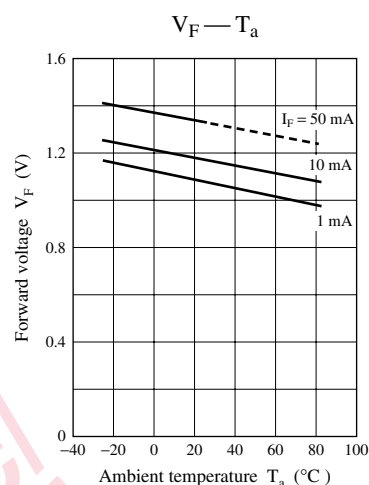
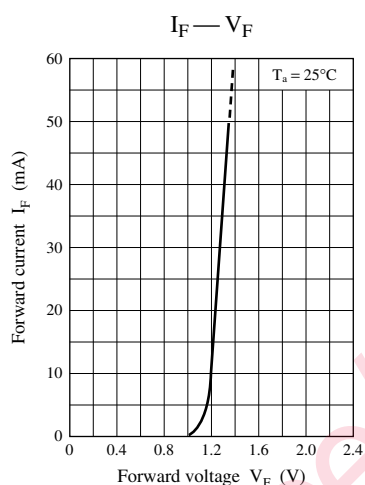
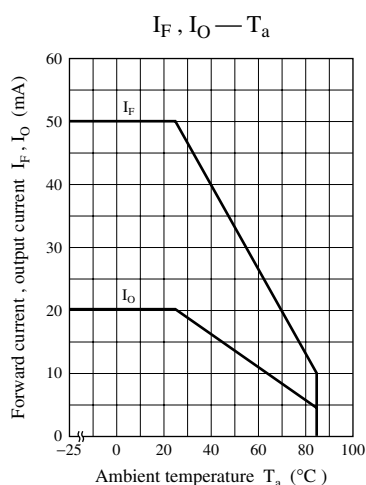
Temperature: 260°C or less

Time: within 3 seconds

Note) Avoid using reflow soldering methods.

3. Other Issues

- 1) Soldering should not create excessive thermal or mechanical stress on the case package or leads.
Excessive stress may cause changes in the shape or characteristics of the package or leads.
- 2) Be careful not to allow solder, flux, solvents, etc. to remain on the case package.
Doing so may cause problems related to transmission characteristics, etc.



Caution for Safety

 **DANGER**

■ This product contains Gallium Arsenide (GaAs).

GaAs powder and vapor are hazardous to human health if inhaled or ingested. Do not burn, destroy, cut, cleave off, or chemically dissolve the product. Follow related laws and ordinances for disposal. The product should be excluded from general industrial waste or household garbage.

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